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Robert J. Barro
Jong-Wha Lee

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ABSTRACT

IMF lending practices respond to economic conditions but are also sensitive to political-economy variables. Specifically, the sizes and frequencies of loans are influenced by a country's presence at the Fund, as measured by the country's share of quotas and professional staff. IMF lending is also sensitive to a country's political and economic proximity to some major shareholding countries of the IMF -- the United States, France, Germany, and the United Kingdom. We measured political proximity by voting patterns in the United Nations and economic proximity by bilateral trading volumes. These results are of considerable interest for their own sake but also provide instrumental variables for estimating the effects of IMF lending on economic performance. Instrumental estimates indicate that the size of IMF lending is insignificantly related to economic growth in the contemporaneous five-year period but has a significantly negative effect in the subsequent five years.

Robert J. Barro
Department of Economics
Harvard University
Littauer Center 218
Cambridge, MA 02138
and NBER
rbarro@harvard.edu

Jong-Wha Lee
Economics Department
Korea University
Seoul, Korea

Participation in programs of the International Monetary Fund has become a common choice for many countries in recent decades. Almost all developing countries have received IMF financial support at least once since 1970. The few exceptions include Botswana, Iran, Malaysia, and Paraguay. Therefore, one question is why so many countries have sought financial assistance from the IMF. Under what circumstances is a country more willing to come to the IMF for assistance and is the IMF more likely to agree on a loan? When would a country benefit from participation in an IMF financial arrangement?

This paper addresses these questions. We investigate the determination and effects of IMF programs by using a cross-country panel data set, which comprises information on 130 countries over the last three decades.

A number of studies, surveyed in Knight and Santaella (1997) and Bird and Rowlands (2001), have investigated the determination of IMF financial arrangements. This paper extends this work by including influences from institutional and political variables. We find that each member country's political connections to the IMF affect the probability and size of an IMF loan. We gauge these political connections by institutional and geopolitical variables, including the size of a country's quota and national staff at the IMF. We also consider each country's political and economic proximity to some major shareholding countries of the IMF—the United States, France, Germany, and the United Kingdom.

The quota determines each country's voting power at the IMF. The national staff variable is the share of own nationals among IMF economists. We find that higher values of both of these variables tend to raise the probability and size of IMF lending. Thus,

greater influence in and connections to the IMF seem to matter for the IMF's lending decisions.

A member country's political and economic proximity to the IMF's major shareholding countries would be important for lending policy if the major countries exert influence on the IMF's decisions. In particular, these major countries would tend to lobby for loans for countries to which they are linked by political or economic interests.

We measure a country's political proximity to the United States by the percentage of times that the country voted in the U.N. General Assembly along with the United States. As a proxy for a country's economic proximity to the United States, we use the share of bilateral trade with the United States in each country's GDP. We construct analogous political and economic linkage variables for the IMF's major European shareholders, France, Germany, and the United Kingdom. We find that the measures of political and economic connections to the United States and, to a lesser degree, to the major European countries play significant roles in raising the probability and size of IMF lending. Hence, as an international organization influenced by the power of its major shareholding countries, the IMF apparently takes politics into account when making decisions on loans.

This political-economy analysis of IMF decision-making is of considerable interest for its own sake. However, we also use this analysis to form instrumental variables to use to estimate the effects of IMF lending on a country's economic performance.

Since its creation in 1944 at Bretton Woods, the role of the International Monetary Fund and the effectiveness of its programs have been controversial. The IMF has claimed to have contributed to the sustainable growth of its member countries by maintaining the

stability of the international exchange and financial system and by providing financial support and policy advice. However, critics say that the IMF has expanded its activities into too many unproductive areas and perhaps caused more harm than good. They argue that the availability of IMF financial support often permits governments to pursue inappropriate policies longer than they otherwise would (Bandow and Vasquez, [1994]). IMF programs are often asserted to be "anti-growth" and to hurt, especially, poor nations. For example, IMF policies were claimed to make recessions only "deeper, longer, and harder" (Stiglitz [2000]). The availability of IMF lending has also been depicted as a source of "limitless bailouts" and "moral hazard" (Barro [1998]).

The critical issue is whether participation in an IMF program helps a country to improve its living standard in the long run. To gain more understanding of this issue, this study investigates the effects of IMF financial arrangements on economic growth. Many studies have used cross-country data to assess the economic effects of IMF programs. These studies have encountered a number of difficulties. The central problem is the separation of the effects of IMF programs from those of other factors. Program participation typically applies to countries that self-select themselves based on their economic and political circumstances. Specifically, countries that are experiencing economic difficulties tend to turn to the IMF for help, and it would be unfair to blame the IMF for these pre-existing conditions. Previous studies have tried to control for the endogeneity of IMF programs in various ways, but we do not regard these attempts as successful.

Our study extends the existing literature in the procedure for controlling for the endogeneity of IMF lending. In our cross-country econometric framework, we use as

instrumental variables the sizes of IMF quotas and professional staff and the political and economic proximity to the United States and three major European countries. If we do not instrument, then we find that an increase in IMF lending is associated with a contemporaneous reduction of economic growth. However, after controlling for endogeneity with our instrumental variables, we find no statistically significant impact of IMF lending on economic growth in the contemporaneous five-year period. However, after controlling for endogeneity, we find that IMF lending has a statistically significant negative effect on growth in the subsequent five years. Our results contrast with the findings of recent studies that use other procedures, but not good instrumental variables, to take account of endogeneity.

The paper is organized as follows. Section I provides a brief discussion of the characteristics of the IMF and its financial programs. Section II assesses the determinants of IMF loan sizes, the frequency of participation in IMF programs, and the probability of IMF loan approval. We study these processes by using Tobit and probit specifications for a cross-country panel. Section III presents evidence on the effects of IMF programs on economic growth. Concluding observations follow in Section IV.

I. The Characteristics of the IMF and its Financial Arrangements

1.1. The Organization of the IMF

The IMF has become an almost universal financial institution, with its membership rising from 44 states in 1946 to 183 at present. However, the members of the IMF do not have an equal voice, unlike the General Assembly of the United Nations. Each member country of the IMF contributes a quota subscription, as a sort of credit-union deposit to the

IMF. Upon joining the Fund, a country pays 25 percent of its quota in the form of international currencies or SDRs and the remaining 75 percent in its own currency. The IMF's total resources amounted to SDR 217 billion ($279 billion) in August 2001.[1] The quota is the basis for determining voting power: each member has 250 basic votes plus one additional vote for each SDR 100,000 of quota. The initial quotas of the original members were determined at the Bretton Woods Conference in 1944. The allocation was based mainly on economic size, as measured by national income and external trade volume. Quotas of new members have been determined by similar principles.

The IMF charter calls for general quota reviews at intervals of not more than five years. These reviews allow for adjustments of quotas to reflect changes in economic power. There have been 12 general reviews since 1950, and 6 of these resulted in an increase in the total size of quotas. Most of these overall increases featured equi-proportional increases of quotas for the individual members (IMF [1998]).

The highest decision-making body of the IMF is the Board of Governors, which consists of one governor and one alternate for each member country. The Governors are usually ministers of finance or sometimes heads of central banks of the member countries. The Board of Governors delegates all except certain reserved powers to an Executive Board, which makes the daily decisions. There are 24 Executive Directors. Eight Executive Directors are appointed by the largest eight shareholders—the United States (37,149 million SDRs or 17.5% percent of the total IMF quotas), Japan (6.3% percent), Germany

[1] In 1969 the IMF created the Special Drawing Right (SDR) as a supplement to existing reserve assets. The currency value of the SDR is determined daily by the IMF from the market exchange rates of a basket of five major currencies.

(6.1%), France (5.1%), the United Kingdom (5.1%), Saudi Arabia (3.3%), China (3.0%), and Russia (2.8%). The others are elected by sixteen groupings of the remaining countries.

The major shareholders have strong influences on the IMF's main decisions. Many important decisions require special voting majorities of 85 percent. Hence, the United States alone and a group of three European countries together have veto power at the IMF. Although the managing director has traditionally been a European, the United States seems to have exerted the strongest voice at the IMF and has sometimes openly wielded this power to influence decisions.

As of December 31, 1999, the IMF had a staff of 2297—693 assistant staff and 1604 professional staff. About two-thirds of the professional staff were economists (IMF [2000, p.95]). The staff reflects the IMF's membership, coming from about 120 countries, but is concentrated in advanced countries. In 1999, among all professional staff, about 29% were from the United States and Canada and about 33% were from Western Europe. Among developing countries, India, China, Argentina, Peru, and Pakistan had relatively large numbers of professional staff.

1.2. IMF Financial Policies and Facilities

The basic conception of the IMF's role, as envisioned at Bretton Woods in 1944, was to guard an "adjustable peg exchange rate system" and provide short-term finance to deal with temporary current-account deficits in advanced countries. Thus, with the breakdown of the par adjustable peg system in 1973, the IMF lost its major role as the guarantor of fixed exchange rates among advanced countries. Nevertheless, the IMF did

not disappear, and its role expanded instead into many new areas. The collapse of the Bretton Woods system was followed by oil price shocks, which led to severe payments imbalances for a large number of developing countries. After the developing countries recovered from the debt crisis of the 1980s, other problems arose, including the transitions of the former Communist countries and the Asian financial crisis. Eventually, the IMF evolved into the "crisis manager" and "development financier" for developing countries.[2]

The primary role of the IMF is to provide credits to member countries in balance-of-payments difficulties. Part of the credit is provided in relation to the quota of a member country. The first tranche, 25% of the quota, is available automatically, without entailing any discussion of policy. The use of IMF resources beyond the first tranche almost always requires an arrangement between the IMF and the member country. Under an IMF arrangement, the amount of resources committed is released in quarterly installments, subject to the observance of policy benchmarks and performance criteria. This process is often referred to as *conditionality*.

Stand-by Arrangements (SBA) and the Extended Fund Facility (EFF) are the main IMF programs designed to provide short-term balance-of-payments assistance to member countries.[3] The typical Stand-By Arrangement covers a period of 1 to 2 years, with repayments scheduled between 3 $^1/_4$ and 5 years from the date of the borrowing. The Extended Fund Facility program, introduced in 1974, was intended to provide somewhat

[2] See Krueger (1998) and Bordo and James (2000) for detailed discussions of the changing role of the IMF.

[3] A number of other short-term IMF arrangements have been introduced to supplement SBA and EFF. These arrangements include the Supplemental Reserve Facility (SRF), the Country Stabilization Fund (CSF), the Compensatory and Contingent Financing Facility (CCFF), and the Systematic Transformation Facility (STF). See IMF (1998) for details.

longer-term financing in larger amounts. The EFF arrangement typically lasts up to 3 years, with repayments scheduled over a period of 4 $^{1}/_{2}$ to 10 years.

The SBA and EFF programs did not cover very low-income countries. Confronted by increasing pressure, the IMF developed several new lending programs to provide long-term loans at subsidized interest rates for poor countries. The Fund established the Structural Adjustment Facility (SAF) in 1986 and the Enhanced Structural Adjustment Facility (ESAF) in 1987. The interest rate charged is 0.5%, and repayments are scheduled over 5-10 years after a 5-year grace period. Most ESAF cases were with sub-Saharan African countries and former planned economies. In 1999, the ESAF was replaced by the Poverty Reduction and Growth Facility (PRGF). Probably these activities should be viewed more as foreign aid, rather than lending or adjustment programs.

Table 1 shows the number and amounts approved for all types of IMF programs over the period 1970 to 2000.[4] Over the last three decades, a total of 725 programs were approved. This total includes 594 short-term and mid-term stabilization programs (SBA and EFF), which are the focus of our analysis. The number of these short-term programs peaked in the early 1980s with the Latin American debt crisis. Although the number declined subsequently, the average size of the loans jumped because of the financial crises experienced by larger countries, such as Mexico, South Korea, Russia, Brazil, Argentina, and Turkey.

[4] The amount of loan approved was not always drawn by the member country. This situation can arise if the IMF terminated the arrangement because the borrower did not meet the conditionality, or if the country ended up not using its full allotment. Sometimes a country utilized an IMF program to build credibility and did not use the borrowing facility at all.

II. Determination of IMF Program Approval and Participation

2.1. Determinants of IMF Financial Arrangements

Participation in an IMF program is a joint decision between a member country and the IMF. Countries that are experiencing economic difficulties come to the IMF for a financial arrangement. Then the IMF determines whether the country meets the Fund's criteria for approval.

To capture the economic determinants of IMF lending, we use a number of standard variables that can be found in the previous literature. Some of these factors can be viewed as influences on a country's demand for loans and others as effects on the IMF's willingness to supply loans. The variables included for each country and time period are the level of international reserves in relation to imports, per capita GDP, the lagged growth rate of GDP, and a dummy variable for whether a country is one of the rich OECD countries.[5]

[5] Previous studies, such as Conway (1994) and Knight and Santaella (1997), include other measures of economic performance, such as current-account deficits and inflation. We found that, once lagged GDP growth and international reserves were considered, these variables did not contribute significantly to the explanation of IMF lending. It is also likely that the occurrence of a currency or banking crisis induces countries to seek IMF financial support. However, the appearance of these crises cannot be regarded as exogenous to other economic events (see, for example, Frankel and Rose [1996]). Because of the endogeneity of the crises, we did not include crisis dummy variables as explanatory variables for IMF lending. If we add a dummy variable for the presence of a currency crisis to the regressions, it has statistically significant positive effects on the probability and size of IMF lending. However, no substantial changes occur in the estimated coefficients of the other explanatory variables that we consider. A dummy variable for banking crises turns out to be statistically insignificant, once the currency-crisis dummy is included. Note that IMF lending does not, by any means, accompany every currency crisis. Since 1970 only one-third of currency-crisis observations were linked with IMF program participation in the same year or one year later (see Park and Lee [2001]). On the other side, many IMF programs occur in the absence of a currency crisis. Hutchison (2001) notes that, in a sample of 67 developing countries over the period 1975-97, only 18% of IMF program participation observations were associated with currency crises.

The key innovation of our analysis is that we model the IMF as a bureaucratic and political organization. Hence, we include additional explanatory variables to reflect this perspective. We include two measures of connection and influence with the IMF—the sizes of a country's IMF quota and professional staff. Then we include geopolitical variables that measure a country's political and economic proximity to major shareholding countries of the IMF. These variables are based on patterns of U.N. voting and bilateral trade flows.

The first institutional variable is the country's share of IMF quotas. This share reflects a country's voting power and also matters directly for a portion of the lending available to a member. Our hypothesis is that, for given economic conditions, a higher country quota raises the probability and size of an IMF loan.

The second institutional variable is the share of a country's nationals among the IMF professional staff of economists. Officially, to avoid conflicts of interest, the IMF does not allow staff members to have direct influence on lending decisions for their home countries. Item 24 of the IMF Code of Conduct for Staff states: "The IMF will seek to avoid assigning nationals to work on policy issues relating specifically to IMF relations with their home country, unless needed for linguistic or other reasons." However, from the standpoint of having good information, the IMF would often like the input from the nationals of a target country. Therefore, although own nationals cannot work directly as desk economists or mission team members for their home countries, these nationals are often sought out for comments on country programs. In addition, the presence of own nationals on the staff can help a country to get more access to inside information and,

thereby, make it easier to negotiate with the IMF on the terms of a program. Thus, overall, our hypothesis is that, for given economic conditions, a larger national staff at the IMF raises the probability and size of a loan.

We measure the national staff for each country by the number of home-country nationals currently working for the Fund. Unfortunately, we lack the information to refine the staff data to consider ranks of positions. Also, it would be interesting to consider the number of ex IMF staff economists who currently work in the governments of the various countries. However, we lack the information to make this extension.

One concern is that IMF quota and staff might reflect a member country's size, rather than political connections, *per se*. Therefore, our empirical analysis of IMF lending also includes a direct measure of the size of the country—the level and square of the log of total GDP.

Another concern is that the number of country nationals on the IMF staff is endogenously determined by the country's involvement with IMF programs, rather than vice versa. However, the effect of a country's IMF program experience seems, in practice, not to have a large impact on hiring of that country's nationals. In particular, the distribution of IMF staff by country is a highly persisting variable. The correlation between the values in 1985 and in 1995 is 0.97 (0.91 in the sample of developing countries). For this reason, lagged program participation turns out to lack explanatory power for the size of the national staff.[6]

[6] If we run a regression with the log of IMF staff share as the dependent variable, the significant explanatory variable, aside from the log of the lagged staff share, is the log of the IMF quota share. The estimated coefficient on a measure of lagged program participation is positive but statistically insignificant.

Similarly, there could be a concern that a country's quota was endogenous, although the tie to a country's past program experience would seem doubtful in this case. In any event, quotas are extremely persistent over time, with much of the allocations determined by the rules set out in 1944 at Bretton Woods.

The IMF is also a political organization governed by its major shareholders. For example, a common claim is that the IMF plays the roles best suited to the national interests of the United States. In the Cold War era, the IMF often supported countries—such as Argentina, Egypt, and Zaire—that were important to the United States for foreign policy reasons, despite the absence of effective reforms (see Krueger [1998] and Bordo and James [2000]). In the 1994 Mexican crisis, the IMF stand-by program was of unprecedented scale, amounting to $17.8 billion or 688 percent of Mexican's quota at the IMF. No doubt this loan resulted from the intense high-level diplomacy between the U.S. government and the IMF. In one incident, the Clinton Administration exerted such strong pressure for rapid action that the usual minimal notice to Executive Directors was not given. Hence, in protest, some European executive directors abstained in the voting (Krueger [1998]).

We use as a proxy for a country's political proximity to the United States the fraction of the votes that each country cast in the U.N. General Assembly along with the United States.[7] We constructed analogous variables for France, Germany, and the United

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[7]We compiled data for 1975-85 on voting patterns in the United Nations from the Inter-University Consortium for Political and Social Research of the University of Michigan. We then updated from on-line data available at the United Nations (unbisnet.un.org). The variable that measures the political proximity with the United States is the fraction of times that the United States and the country in question voted identically (either both voting yes, both voting no, or both voting abstention [or non-participation]) in all General Assembly plenary votes in a given year. Decisions adopted without votes and votes in which the country in question was not eligible to participate were excluded. The results reported below do not change qualitatively if we use some

Kingdom. Our hypothesis is that greater political proximity to the United States or the European countries will raise the probability and size of IMF lending programs.

An analogous U.N. voting variable has been used to explain foreign-aid patterns in research by Ball and Johnson (1996) and Alesina and Dollar (2000). A recent study by Thacker (1999) used a U.N. voting variable to investigate the U.S. influence over the IMF's lending decisions.[8]

We measure economic proximity to the United States by the ratio of the country's bilateral trade with the United States to the country's GDP. We construct analogous variables for the three Western European countries. Our hypothesis is that greater trade relations with the United States or the European countries will raise the probability and size of IMF loan programs.[9]

2.2. Empirical Framework

We have compiled data from 1975 to 1999. Although data are available for most variables and countries on an annual basis, we do not have annual observations for the IMF staff, which was obtained at five-year frequencies. Since we thought that little information

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alternative measures, for example, if we exclude non-participation or abstention.

[8] Thacker used only "key" U.N. votes, as designated by the U.S. Treasury. He then constructed the fraction of the votes on these key issues that each country cast in the U.N. General Assembly along with the United States. One problem with this procedure is that the designation of which votes are key is subjective. In any event, we could not apply this approach because the U.S. Treasury information is available only since 1983, and we also lack analogous information for the European countries. Thacker found that the level of his U.N. voting variable was not significantly related to IMF lending. However, the first difference of his variable had a significantly positive effect. We do not find this pattern with our specification and sample period.

[9] Thacker (1999) and Bird and Rowlands (2001) used U.S. exports to each member country as an explanatory variable for IMF lending decision. They found unexpected *negative* coefficients.

would be gained from annual observations, we arranged all of the data at five-year intervals. Hence, our panel covers 130 countries over the five five-year periods 1975-79, 1980-84, 1985-89, 1990-94, and 1995-99. The panel is unbalanced with a total of 603 observations.[10]

We measure IMF loan program participation in three ways: loan size, participation, and approval. The loan size variable is the period-average of the ratio of IMF loans to GDP, all measured in U.S. dollars. Participation in an IMF program is the fraction of months during each five-year period that a country operated under an IMF loan program. Thus, participation varies (almost) continuously between zero and one. Approval is a binary variable indicating that there was at least one new agreement on lending between the IMF and a member country during a five-year period. Thus, the program approval variable equals one if the IMF and the country made an agreement at any time during the five years. In this paper, we consider only the short-term IMF stabilization programs (SBA and EFF). As discussed before, there are substantial differences between stabilization programs and structural programs.

Using the size of IMF loans as the dependent variable, we specify a Tobit model to take account of the censoring of the dependent variable at zero. The model is specified as

$$L_{it}^{*} = \alpha + \beta X_{it} + \gamma Z_{it} + \delta * time_{t} + u_{it}, \quad (1)$$

$$L_{it} = \max[0, L_{it}^{*}], \quad (2)$$

where the dependent variable, $L_{it,}$ is the loan-size variable for country i during period t.

[10] The sample excludes the countries that lacked IMF membership during each five-year period.

L_{it} =0 applies if the country did not have a loan agreement with the IMF during period t. The vector X_{it} denotes the country-specific economic factors that influence the existence and size of IMF programs. This vector includes the ratio of foreign reserves to imports, per capita GDP, total GDP, lagged GDP growth, and the dummy for the group of advanced OECD countries.[11] The regression also includes period dummies (time) to control for common effects of external factors such as world interest rates. The vector Z_{it} comprises the institutional and geopolitical factors that measure each country's political-economy connections to the IMF—the share of IMF quotas and staff, the political proximity to the United States and the European countries (based on the U.N. voting patterns), and the intensity of trade with the United States and the European countries. The variable u_{it} is a random error term.

An evaluation of IMF program participation also requires a censored-regression framework. The Tobit equation is specified as

$$F_{it}^{*} = \alpha + \beta X_{it} + \gamma Z_{it} + \delta * time_{t} + u_{it}, \tag{3}$$

$$F_{it} = \min[1, \max(0, F_{it}^{*})], \tag{4}$$

where X_{it}, Z_{it}, and time are defined as before. The dependent variable, F_{it}, is the fraction of time for which country i participated in an IMF program during period t.

[11] This group consists of the countries other than Turkey that have been members of the OECD since the 1970s.

Although loan size and IMF program participation are continuous variables, program approval is a binary choice variable. In this case, we use a probit specification:

$$I_{it}^{*} = \alpha + \beta X_{it} + \gamma Z_{it} + \delta * time_{t} + u_{it}, \tag{5}$$

$$\begin{aligned} I_{it} &= 1 \quad if \quad I_{it}^{*} > 0 \\ &= 0 \quad if \quad I_{it}^{*} \leq 0. \end{aligned} \tag{6}$$

The dependent variable, $I_{it,}$ equals one if country i made at least one loan agreement with the IMF during period t and equals zero otherwise.

The specifications in equations (1)-(6) can be viewed as reduced-form models that reflect the demand for and supply of IMF loans. To minimize reverse-causality problems, all explanatory variables are measured at the beginning of each period or as lagged values.

We have tried various functional forms for each model and selected the ones that delivered the best goodness-of-fit. It turns out that per capita GDP and the log of GDP each enter as quadratics. The IMF quota share, the IMF staff share, the U.N. voting variables, and the bilateral-trade-share variables enter as their log values.[12]

The Tobit and probit estimation models apply to the panel data set of 130 countries over the five five-year periods from 1975 to 1999. To estimate these systems, we use a random-effects specification for the error terms. Our reasoning is that a country that is

[12] To keep the zero observations when making the log transformations, we added 0.0009 to each observation of staff share, 0.0002 to each observation of quota share, and 0.0001 to each observation of bilateral trade share. These values are the minimum non-zero observations for staff share, quota share, and bilateral trade share in the sample. The results are not sensitive to the specific values added for the log transformations.

favored by the IMF in one period—due to unexplained factors—is likely to be similarly favored in other periods.[13] We have also estimated pooled Tobit or probit models in which a robust variance matrix is used to account for any within-country correlation of the error terms over time. With this alternative specification, the statistical significance of the political-economy variables, especially the IMF staff share, rises substantially. The likely reason is that the random-effects terms pick up a lot of the explanatory power of variables, such as the shares of IMF staff and quotas, that tend to persist over time for a given country.

The summary statistics for all variables are shown in Table 2. Over the sample period, the average size of an IMF loan (including the zeroes) was 0.6% of GDP. Countries on average participated in an IMF financial arrangement 19% of the time, and 36% of the observations (for five-year periods) featured at least one IMF program approval.

2.3. Estimation Results for IMF Lending

Table 3 presents estimation results for the Tobit equation for IMF loan size (equations [1] and [2]). Consider first the results in columns 1-4. Column 1 excludes all political-economy variables. Column 2 includes the IMF staff share and the U.N. voting and trade intensity variables associated with the United States. Column 3 substitutes the IMF quota share for the IMF staff share. Column 4 includes all four of these political-economy variables.

[13]Random-effects Tobit or probit models assume strict exogeneity of the explanatory variables (see Wooldridge [2002]).

The lagged growth rate of GDP is significantly negative in all of the specifications. The estimated coefficient in column 4 implies that, holding other variables constant, a decline in GDP growth by 1 percentage point per year would increase the ratio of IMF lending to GDP by 0.16 percentage point.

The ratio of international reserves to imports is also significantly negative in all of the specifications. The estimated coefficient in column 4 implies that a decrease in reserves by one month of imports would raise the ratio of IMF lending to GDP by 0.2 percentage point.

The IMF loan size has a non-linear relationship with per capita GDP. In all specifications, the level is significantly positive and the square is significantly negative. (The two variables together are always jointly significant at a p-value less than 0.01.) Hence, the probability of having an IMF program initially *increases* with per capita GDP but later decreases. The estimated coefficients in column 4 imply that the switch occurs at a per capita GDP of $2860 (1985 U.S. dollars), which is above the sample median of $2527. The overall marginal effect of per capita GDP at the sample mean of $4481 is estimated to be negative. At that point, an increase in per capita GDP by $1000 is estimated to decrease the ratio of IMF lending to GDP by 0.3 percentage point.

The positive relation between IMF lending and per capita GDP in the low range of per capita GDP likely reflects the Fund's reluctance to provide stabilization loans to countries that are not creditworthy. The negative effect in the upper range of per capita GDP likely signals the decreased demand for IMF loans among the rich countries, which have other sources of credit.

We find that, after controlling for the log of per capita GDP and its square, the dummy for the group of rich OECD countries has negative estimated coefficients in all of the specifications. The estimated value is not statistically significant in columns 1-4 but is marginally significant in some cases that we consider later.[14] The negative coefficient on the OECD dummy variable can be interpreted as another indicator of a low demand for IMF loans by advanced economies.

The log of total GDP enters as a level and its square. (Recall that we include these variables mainly to be sure that the IMF quota and staff variables are not just proxies for the scale of an economy.) The estimated coefficients are, in each case, positive for the level of log(GDP) and negative for the square. The two coefficients are jointly marginally significant in some cases, with p-values ranging from 0.04 in column 4 to 0.85 in column 2. Thus, this scale variable appears not to be very important in the determination of IMF loan size as a ratio to GDP. These variables turn out to be statistically more significant in some of the systems for IMF program participation and approval.

The results in columns 2-4 of Table 3 indicate that the political-economy variables are important overall for explaining IMF lending decisions. When considered jointly, the p-values for the statistical significance of these variables is between 0.0003 (column 4) and 0.014 (column 2)—see the line marked as p-value (a) in the table. If we consider the group of these variables exclusive of the bilateral trade share with the United States, then the p-values range from 0.0013 (column 4) to 0.048 (column 2)—see the line marked as p-value (b).

[14] No substantial changes occur in the main results if we exclude the OECD dummy variable in the various systems.

In column 4, the economic proximity to the United States, as gauged by bilateral trade, and the IMF quota share each have individually significantly positive estimated effects at the 5% critical level. The estimated coefficients on the U.N. voting variable with the United States and the IMF staff share are also positive and individually significant at the 10% level.

The estimated coefficients in column 4 imply that an increase in the log of the IMF quota share by 1.24 (its standard deviation) raises the IMF loan size by 1.9 percent of GDP. An increase in the log of the IMF staff share by 1.26 (the variable's standard deviation) is estimated to raise IMF lending by 0.4 percent of GDP.

The results also indicate that IMF lending tends to increase when a country has high political and economic proximity to the United States. An increase in the U.N. voting variable for the United States by 0.48 (its standard deviation) is estimated to raise the ratio of IMF lending to GDP by 0.4 percentage point. Similarly, an increase in the intensity of trade with the United States by 1.5 (its standard deviation) is estimated to raise the ratio by 0.4 percentage point.

Column 5 modifies the specification from column 4 to measure the U.N. voting and trade intensity variables in relation to the IMF's major European shareholders, rather than the United States. The U.N. voting and bilateral trade variables are now averages for France, Germany, and the United Kingdom. The estimated coefficient on the U.N. variable for Europe is positive and marginally significant. The estimated effect of the European trade variable is also positive but less statistically significant.[15]

[15] We report here only the results when the U.N. voting and trade variables are averages for the three

Column 6 includes U.N. voting and trade intensity variables for the United States together with those for the average of the European countries. In this setting, only the U.S. trade intensity variable is individually statistically significant. However, the joint significance of the political-economy variables is clear—the p-value is 0.0008 for all six variables and 0.014 for the four variables exclusive of the two trade intensity measures.

Figure 1 shows graphically the effect of each explanatory variable on the ratio of IMF lending to GDP, based on the estimation results in columns 4 and 5 of Table 3. Since the responses refer to a one-standard-deviation change of each explanatory variable, the figure can be used to gauge the relative importance of each variable in influencing the size of IMF loans.

For example, based on column 4 of Table 3, a reduction in international reserves (by one standard deviation or 2.9 months of imports) raises IMF lending by 0.5 percent of GDP. A decline in GDP growth (by one standard deviation or 0.035) increases the IMF loan-to-GDP ratio by 0.5 percentage point. An increase in the log of per capita GDP (by one standard deviation or 4.7, starting from the sample mean) generates a reduction in the loan size by 1.4 percent of GDP.

Figure 1 also shows the effects from the political-economy variables. Again using the estimates from column 4 of Table 3, an increase in the log of the IMF quota (by one standard deviation or 1.24) has a particularly large effect—the loan-to-GDP ratio rises by

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European countries. Since the U.N. voting variables for France, Germany, and the United Kingdom are highly correlated (correlation coefficients above 0.95), it is hard to disentangle the effects for the individual countries. The correlations between the U.N. voting variables for the United States and for each of the European countries is much lower—ranging from 0.7 to 0.8. The trade intensity variables are substantially less correlated than the voting variables, ranging from 0.03 (between the United States and France) to 0.45 (between France and Germany).

1.9 percentage point. The corresponding response to an increase in the log of IMF staff (by one standard deviation or 1.26) is by 0.4 percent of GDP. If a country votes more often with the United States in the United Nations (that is, the log of the variable rises by one standard deviation or 0.48), then the IMF loan-to-GDP ratio rises by 0.4 percentage point. The corresponding effect from a rise in the trade intensity variable for the United States (by one standard deviation or 1.50) is an increase by 0.4 percentage point.

For the European variables, we use the estimates shown in column 5 of Table 3. If a country votes more often with the average of the European countries in the United Nations (that is, the log of the variable increases by one standard deviation or 0.35), then the IMF loan-to-GDP ratio rises by 0.4 percentage point. The corresponding effect from a rise in the trade intensity variable for Europe (by one standard deviation or 1.0) is an increase by 0.3 percentage point.

Table 4 presents estimation results from the Tobit equations for IMF program participation, as specified in equations (3) and (4). The results are, in most respects, similar to those for loan size. For example, the p-values for joint significance of the political-economy variables are all below 0.03. The estimated coefficients on the IMF quota share, IMF staff share, and the U.N. voting variable with the United States are all positive and individually at least marginally significant in columns 2-4. The estimated coefficient on the U.N. voting variable for Europe is also significantly positive in column 5. However, the trade intensity variables are not statistically significant in the specifications in Table 4. Figure 2 illustrates the results graphically.

Table 5 presents the estimation results from the probit equations for the approval of IMF programs, as specified in equations (5) and (6). The results are, in many respects, similar to those found in the previous tables for loan size and loan participation. However, the statistical significance of the political-economy variables tends to be less than that found before. For example, in column 4, which uses the U.S. variables for U.N. voting and trade intensity, the four political-economy variables are jointly significant with a p-value of 0.034. However, if the trade variable is omitted, then the remaining three variables are jointly only marginally significant—the p-value is 0.096. Figure 3 shows the estimated effects graphically.[16]

III. Effects of IMF Programs on Economic Growth

3.1. Methodological Issues

A number of previous studies have used cross-country data to assess the effects of IMF programs on economic performance, including economic growth, investment, inflation, and the balance of payments. A variety of methodologies have been applied to these evaluations.

An assessment of the impact of an IMF adjustment program requires an evaluation of the performance of program countries in comparison with the performance that would have prevailed in the absence of the IMF assistance. In other words, we have to evaluate whether the IMF programs were associated with better or worse economic outcomes *than would otherwise have occurred.* It is difficult conceptually and practically to construct this counterfactual in order to disentangle the effects of IMF programs from those of other factors.

[16] The point estimate for the effect of European trade intensity in column 5 is negative—this result is not shown in Figure 3.

The basic problem is that IMF program participation is an endogenous choice, as shown in the previous section. Program participation applies to countries that self-select themselves based on their economic and political circumstances.

Many studies have used the "before-after" approach or the "with-without" approach to assess the impact of an IMF adjustment program (see the survey in Haque and Khan [1998]). The before-after approach uses non-parametric statistical methods, which compare performance during a program with that prior to the program. Thus, this approach assumes that, if not for the program, the performance indicators would have taken their pre-crisis values (at least up to random error terms). We regard this assumption as unreasonable because participation in an IMF program typically reflects changed circumstances for a country.

The with-without methodology compares the behavior of key variables in the program countries to their behavior in non-program countries, which constitute a control group. Thus, this procedure assumes that only the exogenous imposition of an IMF program distinguishes the program countries from the control group. We regard this assumption as untenable, because participation in an IMF program typically reflects circumstances that differ between program and non-program countries. Hence, we believe that the before-after and with-without approaches do not adequately address the selection-bias problem.

Following Goldstein and Montiel (1986), a number of studies adopted a new approach to assess the economic impact of IMF programs. This method is called the Generalized Evaluation Estimator (GEE). This approach attempts to correct for the non-

random selection of program countries by using the Heckman selection model. The GEE method first estimates an equation for participation in an IMF program and then calculates Heckman's inverse Mills ratio, which gives an estimated probability of program participation. Then the approach controls for non-random self-selection in the estimation of the equations for economic performance by including the inverse Mills ratio in those equations. Thus, this approach tries to control for non-random selection into IMF programs by holding fixed a measure of the probability of this selection.

The GEE method has, according to Haque and Khan (1998), become "the estimator of choice in evaluating the effects of Fund-supported adjustment programs." This situation is surprising because the approach has obvious shortcomings. The basic problem is that the method typically does not include variables in the selection equation that are excluded (on reasonable grounds) from the economic-performance equations. Hence, identification depends implicitly on auxiliary restrictions, for example, on assumptions about the distributions of error terms and on the exclusion of non-linear terms in the performance equations. Since these auxiliary assumptions tend to be fragile, the inclusion of an inverse Mills ratio typically does not provide an adequate correction for selection bias.

An alternative approach is the classical instrument-variables technique. If available, an instrument that is exogenous to the dependent variable in an economic performance equation can be used to control for the endogeneity of IMF lending. The only reason that this method has not been the "estimator of choice" in evaluating IMF or other programs is the lack of good instruments. We believe that our political and institutional analysis of IMF

lending provides good candidates for instruments and, therefore, argues for the use of the instrumental-variables technique to evaluate the economic effects of this lending.

3.2. Impacts of IMF Programs on Economic Growth

In this section we investigate the effects of IMF lending programs on economic growth. The existing literature provides conflicting results on the growth effects of IMF programs, depending on the sample and methodology. According to Haque and Kahn (1998), among eleven studies based on the before-after or with-without approach, only one found a statistically significant positive impact. The others found either a zero effect or weak positive impacts from IMF programs. However, given the underlying methodological problems, it is unclear what to make of this record.

Studies based on the GEE method present more diverse results. Kahn (1990) reported that IMF program participation significantly lowered the growth rate in the program year, but the adverse effects diminished over time. Przeworski and Vreeland (2000) and Hutchison (2001) found that participation in an IMF program led to sizable reductions in output growth. In contrast, Conway (1994) observed that participation in an IMF program significantly raised the growth rate over the one to two years subsequent to the program. Dicks-Mireaux, Mecagni, and Schadler (2000) also found statistically significant beneficial effects of IMF structural-adjustment programs on economic growth. Given the unclear basis for identification in these approaches, it is not surprising that the conclusions are so varied.

We assess the effects of IMF program participation on economic growth by extending previous work in several ways. Most importantly, we use an instrumental-variables approach, using the instruments suggested by our analysis of the determinants of IMF lending. The instruments that we employ are the IMF national staff and quota variables and the variables that measure a country's political and economic proximity to the United States and the major European countries. As discussed before, these proximity variables are based on the patterns in U.N. voting and bilateral trade.[17]

Many previous studies used annual data to focus on the impact of IMF program participation over relatively short time periods, mostly one or two years. However, it is hard to distinguish long-term growth from business cycles at an annual frequency. Therefore, our empirical analysis uses cross-country data at a five-year frequency. We use panel data for over 80 countries, and we utilize the cross-country growth framework that has been extensively investigated in the literature (see, for example, Barro [2000]). After controlling for other growth determinants isolated in this previous work, we can assess the impact of IMF program participation on growth over the contemporaneous five-year period and for the subsequent five-year period.

Since the general approach has been described in previous studies and is likely to be familiar, we provide only a brief discussion. We include the following variables as determinants of the growth rate of per capita GDP: (1) the log of initial per capita GDP; (2) human resources (educational attainment, life expectancy, and fertility); (3) the ratio of

[17] We also include a dummy for IMF membership as an additional instrument in order to control for the non-member countries that were not eligible for IMF loans. Since there are only three observations for non-members in the sample, this IMF membership dummy does not play a significant role.

investment to GDP; (4) changes in the terms of trade (export prices relative to import prices); and (5) institutional and policy variables (government consumption, a subjective index of the rule of law, international openness, and inflation).[18] For the measure of educational attainment, we use the average years of school attainment of males aged 25 and over at the secondary and higher levels. Government consumption is measured by the ratio of government consumption (exclusive of outlays on education and defense) to GDP. The rule-of-law index comes from an evaluation by an international consulting firm that provides advice to international investors. The openness measure is the ratio of exports plus imports to GDP, filtered for the usual effect of country size (the logs of population and area) on this trade measure.

Table 6 presents the regressions results. The dependent variables are the five-year growth rates of per capita GDP for the periods 1975-80, 1980-85, 1985-90, 1990-95, and 1995-2000. Estimation is by three-stage least squares, using mostly lagged values of the independent variables as instruments (see the notes to Table 6). Most explanatory variables enter significantly with the expected signs. Initial per capita GDP, fertility, government consumption, and inflation are significantly negative. Schooling, life expectancy, international openness, and the growth rate of the terms of trade are significantly positive. Some variables, notably the investment ratio, are statistically insignificant in these systems.

[18] In a preliminary version of this paper, we also included in the growth equations dummy variables for the occurrence of currency and banking crises. We found, as in Barro (2001), that currency and banking crises had significantly negative estimated coefficients in the contemporaneous five-year period. In the subsequent five-year period, the impacts became positive but were smaller in magnitude than the initial effects. In the present analysis, we exclude the currency and banking variables because they are endogenous—that is, they would be related to current economic outcomes, such as the rate of economic growth. Moreover, we lack adequate instruments for the currency and banking crisis variables.

Our primary interest is in the impact of IMF programs. We focus on the effects of IMF loan size and program participation because these variables seem to be more relevant than program approval for the assessment of the effects of IMF programs on economic growth.

Column 1 of Table 6 includes as an independent variable the contemporaneous IMF loan size as a ratio to GDP. Column 2 allows also for a lagged effect. In the estimation for these columns, we include the actual values of current and lagged IMF loan size as a ratio to GDP in the instrument lists. Thus, these results do not take account of the endogeneity of IMF lending.

Column 1 shows that the contemporaneous impact of IMF loan size on growth is significantly negative. The estimated coefficient (-0.257, s.e. =0.062) implies that an increase in IMF lending by 1 percent of GDP lowers the growth rate contemporaneously by 0.26 percentage point per year. However, our presumption is that this strong inverse relation between IMF lending and growth reflects the endogeneity of the lending.

Column 2 allows for contemporaneous and lagged effects of IMF lending. The estimated contemporaneous effect is similar to that in column 1. The estimated lagged effect is also negative, and the estimated coefficient is marginally significant at the 10% level (-0.118, s.e.=0.063).

Columns 3 and 4 include the IMF loan size and program participation together. The idea is that the participation variable would pick up any effect of program involvement that was independent of the size of the loan. In the estimation for these columns, the instrument lists include current and lagged IMF program participation along with current and lagged

loan size. That is, no correction for endogeneity applies. The regression results show that the estimated coefficients on IMF program participation—contemporaneous and lagged—differ insignificantly from zero. That is, IMF involvement, independent of loan size, does not seem to be relevant for economic growth.

In columns 5-8, the estimation technique changes to use as instruments the log of the IMF staff share, the log of the IMF quota share, the log of the fraction of U.N. votes along with the United States and the European countries, and the log of the intensity of trade with the United States and the European countries.[19] The actual values (contemporaneous and lagged) of IMF loan size and participation are excluded from the instrument lists.

The results in column 5 should be compared with those in column 1. With the use of the instrumental variables, the estimated coefficient on the contemporaneous IMF loan size becomes smaller in magnitude than before and is now statistically insignificantly different from zero (-0.122, s.e. =0.092). In column 6, which adds the lagged loan size, the estimated coefficient on the lagged value is larger in magnitude than that in column 2 and is now individually significant at the 1 percent level (-0.272, s.e.=0.097). Hence, an increase in IMF lending by 1 percent of GDP is estimated to lower the growth rate in the subsequent five-year period by 0.27 percentage point per year.

Hence, where we use the political-economy variables as instruments, we find that contemporaneous IMF lending is insignificantly related to growth (although the point estimate is still negative). However, lagged lending has a larger negative effect than before.

[19] Columns 5-8 include contemporaneous and lagged values of these variables in the instrument lists.

In other words, although it is often argued that an IMF program retards economic growth in the short run but improves it in the long run, our instrumental estimates suggest a different pattern. We find that an IMF program may not have much deleterious effect in the short run (over a contemporaneous five-year period) but does seem to have a substantial adverse effect in the longer run (over the next five years).

Columns 7 and 8 apply instrumental estimation to the systems that include current and lagged IMF program participation. The point estimates for the participation variables are negative, but the estimated coefficients are never statistically significant. Hence, we still find that IMF program involvement does not seem to matter for growth independently of the loan size.

IV. Concluding Observations

We began by taking a political-economy approach to the IMF's lending decisions. Holding fixed a set of standard economic variables, IMF lending was influenced by a country's presence at the Fund, as measured by the country's share of quotas and professional staff. IMF lending was also sensitive to a country's political and economic proximity to some major shareholding countries of the Fund—the United States, France, Germany, and the United Kingdom. We measured political proximity by voting patterns in the U.N. General Assembly and economic proximity by bilateral trading volumes. The set of political-economy variables was statistically significant overall for explaining the size of IMF loans, the frequency of participation in IMF lending programs, and the probability of IMF loan approval.

This political-economy analysis of IMF lending practices is of substantial interest for its own sake. However, we also use the results to create a set of instrumental variables to use to estimate the effects of IMF lending on economic growth. If we do not instrument—that is, if the instrument lists include the IMF lending variables—then IMF lending is estimated to have a substantial inverse relation to growth in the contemporaneous five-year period. However, this relation likely reflects reverse causation, whereby adverse economic conditions generate greater IMF involvement.

The instrumental estimates indicate that the contemporaneous relation of IMF lending to economic growth is statistically insignificant (although the point estimate of the coefficient is still negative). However, IMF lending has a statistically significant negative influence on economic growth in the subsequent five-year period. Therefore, although IMF lending may not influence growth a lot in the short run, this lending seems to have a substantial adverse effect in the longer run—that is, with a lag on the order of five years.

We plan further research to assess the effects of IMF lending on other economic variables, such as investment, inflation, fiscal deficits, and current-account deficits. We plan also to apply methodologies analogous to the one developed in this study to evaluate the economic effects of lending programs by the World Bank and of foreign-aid programs.

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Table 1. Approval of IMF Programs, Fiscal Years 1970-2000

Number of programs approved
(total amount committed under arrangements in million of SDRs)

Period	Stabilization Programs		Structural Programs		Total
	SBA	EFF	SAF	ESAF/PRGF	
1970-1974	82				82
	(4,913)				(4,913)
1975-1979	83	7			90
	(8,091)	(1,895)			(9,945)
1980-1984	116	26			142
	(20,520)	(22,692)			(43,213)
1985-1989	90	3	29	7	129
	(14,117)	(1,277)	(1,455)	(955)	(17,804)
1990-1994	79	12	8	27	126
	(14,974)	(14,479)	(130)	(3,309)	(32,893)
1995-2000	72	24	1	59	156
	(83,250)	(36,659)	(182)	(6,961)	(126,052)

Notes: An approval of an IMF program indicates that a new IMF financial arrangement was approved for a country in the fiscal year (FY2000 corresponds to the period from May 1, 1999 to April 30, 2000). SBA is Stand-by Arrangement, EFF is Extended Fund Facility, SAF is Structural Adjustment Facility, and ESAF is the Enhanced Structural Adjustment Facility. The ESAF was replaced by the Poverty Reduction and Growth Facility (PRGF) in 1999.

Source: IMF (2000, Appendix Table II-1).

Table 2. Summary Statistics for Variables Used in Regressions

Variable	Mean	Median	σ
Loan size (ratio to GDP)	0.006	0	0.017
Participation in IMF stabilization programs (EFF and SBA only)	0.187	0	0.282
Approval of IMF stabilization programs (EFF and SBA only)	0.358	0	0.480
GDP growth rate (lagged)	0.012	0.013	0.035
International reserves (months of imports)	3.291	2.634	2.866
Real GDP per capita (1985 U.S. thousand dollars)	4.481	2.527	4.653
Log(real GDP) (1985 U.S. million dollars)	9.805	9.551	2.094
Group of advanced OECD countries	0.179	0	0.384
IMF quota share (log)	-5.806	-6.162	1.240
IMF staff share (log)	-5.640	-5.795	1.256
Political proximity to the United States (log)	-1.433	-1.416	0.479
Political proximity to major Europe (log)	-0.883	-0.965	0.346
Intensity of trade with the United States (log)	-3.132	-3.090	1.503
Intensity of trade with major Europe (log)	-3.412	-3.332	0.980

Notes to Table 2

The sample consists of 603 observations for the five five-year periods from 1975 to 1999. Loan size is the period average of the ratio of IMF loans to GDP. Only the EFF and SBA loans are included here. Participation is the fraction of time that a country was in an IMF stabilization program in each five-year period. Approval is a dummy variable that equals one if a new IMF stabilization program was approved at any time during each of the periods. Data on GDP come from Summers and Heston (1991), PWT 5.6, and updates based on GDP growth rates from the World Bank and IMF. The group of advanced OECD countries consists of countries other than Turkey that have been members of the OECD since the 1970s. The share of IMF staff nationals is the fraction of own nationals in IMF economists. The share of IMF quota is the fraction of each country's quota in the IMF total. Political proximity to the United States is the log value of the fraction of times out of all votes that each country voted in the U.N. General Assembly along with the United States. Political proximity to major Europe is the average value of the political proximity measures for France, Germany, and the United Kingdom. Trade intensity with the United States is the bilateral trade (exports and imports) between a country and the United States, expressed as a ratio to the country's GDP. Trade intensity with major Europe is the average value of the trade intensity measures for France, Germany, and the United Kingdom. All variables except the GDP growth rate and the IMF program approval, participation, and loan size are the values at the beginning of each period. The GDP growth rate is the average over the previous five-year period.

Table 3. Determinants of IMF Loan Size

	(1)	(2)	(3)	(4)	(5)	(6)
GDP growth rate	-0.224	-0.196	-0.159	-0.157	-0.167	-0.164
	(0.044)	(0.043)	(0.044)	(0.044)	(0.045)	(0.044)
International	-0.00205	-0.00184	-0.00186	-0.00188	-0.00194	-0.00176
reserves	(0.00055)	(0.00060)	(0.00060)	(0.00059)	(0.00060)	(0.00059)
GDP per capita	0.0072	0.0056	0.0051	0.0053	0.0060	0.0050
	(0.0020)	(0.0024)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
GDP per capita	-0.00099	-0.00089	-0.00092	-0.00093	-0.00096	-0.00090
squared	(0.00023)	(0.00025)	(0.00025)	(0.00024)	(0.00025)	(0.00024)
Log(GDP)	0.0067	0.0014	0.0059	0.0057	0.0097	0.0052
	(0.0060)	(0.0073)	(0.0074)	(0.0072)	(0.0072)	(0.0072)
Log(GDP) squared	-0.00026	-0.00004	-0.00057	-0.00062	-0.00075	-0.00052
	(0.00031)	(0.00038)	(0.00042)	(0.00041)	(0.00042)	(0.00042)
Group of advanced	-0.0085	-0.0131	-0.0110	-0.0135	-0.0197	-0.0172
OECD countries	(0.0082)	(0.0100)	(0.0098)	(0.0097)	(0.0105)	(0.0102)
Log(IMF quota)	--	--	0.0149	0.0149	0.0133	0.0130
			(0.0049)	(0.0048)	(0.0052)	(0.0050)
Log(IMF staff)	--	0.0031	--	0.0032	0.0029	0.0030
		(0.0020)		(0.0019)	(0.0020)	(0.0019)
Political proximity	--	0.0100	0.0090	0.0084	--	0.0036
to the U.S.		(0.0055)	(0.0055)	(0.0055)		(0.0087)
Political proximity	--	--	--	--	0.0106	0.0076
to major Europe					(0.0073)	(0.0117)
Intensity of trade	--	0.0024	0.0023	0.0024	--	0.0025
with the U.S.		(0.0011)	(0.0011)	(0.0011)		(0.0011)
Intensity of trade	--	--	--	--	0.0026	0.0024
with major Europe					(0.0021)	(0.0020)
p-value (a)	--	0.014	0.0005	0.0003	0.0018	0.0008
(b)		0.048	0.0017	0.0013	0.0088	0.014
Number of obs.	603	603	603	603	603	603

Notes to Table 3

The dependent variable is the average of the ratio of the amount of IMF loans (SBA and EFF only) to GDP over the five-year periods 1975-1979, 1980-1984,…,1995-1999. Tobit estimation with a random-effects specification was applied to the panel data for the five five-year periods. The summary statistics for all variables are shown in Table 2. See the notes to Table 2 for definitions of variables. Period dummies are included (not shown). Standard errors of the estimated coefficients are reported in parentheses. The p-value (a) indicates the significance level associated with the test of the joint hypothesis that the coefficients on the included political-economy variables—IMF quota share, IMF staff share, U.N. voting variable, and trade intensity variable—are all equal to zero. The p-value (b) applies to the same group of variables except for the trade intensity variable.

Table 4. Determinants of IMF Program Participation

	(1)	(2)	(3)	(4)	(5)	(6)
GDP growth rate	-2.01	-1.97	-1.60	-1.59	-1.67	-1.64
	(0.72)	(0.72)	(0.75)	(0.75)	(0.75)	(0.75)
International	-0.0306	-0.0298	-0.0292	-0.0298	-0.0308	-0.0292
reserves	(0.0105)	(0.0103)	(0.0104)	(0.0103)	(0.0103)	(0.0103)
GDP per capita	0.115	0.102	0.096	0.101	0.107	0.095
	(0.045)	(0.043)	(0.044)	(0.043)	(0.043)	(0.043)
GDP per capita	-0.0180	-0.0173	-0.0176	-0.0178	-0.0180	-0.0172
squared	(0.0047)	(0.0045)	(0.0046)	(0.0045)	(0.0045)	(0.0044)
Log(GDP)	0.222	0.192	0.244	0.239	0.299	0.242
	(0.136)	(0.134)	(0.140)	(0.137)	(0.133)	(0.136)
Log(GDP) squared	-0.0082	-0.0078	-0.0133	-0.0140	-0.0165	-0.0136
	(0.0071)	(0.0069)	(0.0080)	(0.0078)	(0.0078)	(0.0079)
Group of advanced	-0.14	-0.26	-0.21	-0.30	-0.38	-0.35
OECD countries	(0.18)	(0.18)	(0.18)	(0.18)	(0.19)	(0.19)
Log(IMF quota)	--	--	0.165	0.156	0.146	0.140
			(0.093)	(0.092)	(0.095)	(0.094)
Log(IMF staff)	--	0.065	--	0.062	0.058	0.059
		(0.035)		(0.035)	(0.035)	(0.035)
Political proximity	--	0.185	0.173	0.167	--	-0.016
to the U.S.		(0.095)	(0.095)	(0.095)		(0.148)
Political proximity	--	--	--	--	0.286	0.308
to major Europe					(0.126)	(0.197)
Intensity of trade	--	0.0273	0.0254	0.0260	--	0.0288
with the U.S.		(0.0200)	(0.0202)	(0.0199)		(0.0200)
Intensity of trade	--	--	--	--	0.017	0.014
with major Europe					(0.037)	(0.036)
p-value (a)	--	0.022	0.025	0.013	0.010	0.017
(b)		0.022	0.026	0.014	0.009	0.018
Number of obs.	603	603	603	603	603	603

Note: Participation is the fraction of time that a country was in an IMF stabilization program in each five-year period. Tobit estimation with a random effects-specification was used. See the notes to Tables 2 and 3 for additional information.

Table 5. Determinants of Approval of IMF Programs

	(1)	(2)	(3)	(4)	(5)	(6)
GDP growth rate	-6.43	-6.22	-5.65	-5.61	-5.61	-5.54
	(2.21)	(2.18)	(2.29)	(2.28)	(2.30)	(2.28)
International	-0.101	-0.091	-0.091	-0.091	-0.100	-0.092
reserves	(0.031)	(0.030)	(0.031)	(0.030)	(0.031)	(0.030)
GDP per capita	0.278	0.212	0.2001	0.210	0.263	0.210
	(0.122)	(0.116)	(0.118)	(0.117)	(0.118)	(0.117)
GDP per capita	-0.0409	-0.0371	-0.0373	-0.0378	-0.0413	-0.0378
squared	(0.0126)	(0.0118)	(0.0121)	(0.0119)	(0.0122)	(0.0119)
Log(GDP)	0.77	0.61	0.70	0.67	0.89	0.69
	(0.37)	(0.36)	(0.38)	(0.37)	(0.37)	(0.37)
Log(GDP) squared	-0.0298	-0.0245	-0.0319	-0.0333	-0.0453	-0.0351
	(0.0193)	(0.0187)	(0.0215)	(0.0211)	(0.0213)	(0.0212)
Group of advanced	-0.61	-0.83	-0.72	-0.85	-1.08	-0.93
OECD countries	(0.47)	(0.47)	(0.47)	(0.47)	(0.50)	(0.49)
Log(IMF quota)	--	--	0.23	0.22	0.26	0.24
			(0.25)	(0.25)	(0.26)	(0.25)
Log(IMF staff)	--	0.144	--	0.143	0.146	0.142
		(0.099)		(0.099)	(0.101)	(0.099)
Political proximity	--	0.49	0.49	0.46	--	0.13
to the U.S.		(0.28)	(0.28)	(0.28)		(0.46)
Political proximity	--	--	--	--	0.70	0.59
to major Europe					(0.39)	(0.63)
Intensity of trade	--	0.110	0.108	0.107	--	0.115
with the U.S.		(0.059)	(0.060)	(0.059)		(0.059)
Intensity of trade	--	--	--	--	-0.029	-0.045
with major Europe					(0.100)	(0.099)
p-value (a)	--	0.023	0.044	0.034	0.126	0.074
(b)		0.063	0.123	0.096	0.068	0.116
Number of obs.	603	603	603	603	603	603

Note: Approval is a dummy variable that equals one if a new IMF stabilization program was approved in any year of each of the five-year periods. Probit estimation with a random-effects specification was used. See the notes to Tables 2 and 3 for additional information.

Table 6. Effects of IMF Programs on Economic Growth
(panel of five 5-year periods for 81 countries over the period 1975-2000)

	(1)	(2)	(3)	(4)
Instruments	**Actual values of IMF loan size and program participation**			
Log(per capita GDP)	-0.0235 (0.0043)	-0.0243 (0.0043)	-0.0239 (0.0044)	-0.0257 (0.0045)
Male upper-level schooling	0.0036 (0.0019)	0.0033 (0.0019)	0.0037 (0.0019)	0.0037 (0.0019)
Log(life expectancy)	0.036 (0.019)	0.040 (0.019)	0.038 (0.020)	0.045 (0.020)
Log(total fertility rate)	-0.0258 (0.0063)	-0.0266 (0.0063)	-0.0253 (0.0064)	-0.0262 (0.0063)
Investment/GDP	0.011 (0.033)	0.005 (0.032)	-0.009 (0.034)	-0.002 (0.033)
Government consumption/GDP	-0.078 (0.026)	-0.075 (0.026)	-0.079 (0.026)	-0.078 (0.026)
Rule-of-law index	0.0056 (0.0079)	0.0061 (0.0078)	0.0057 (0.0079)	0.0066 (0.0078)
Openness measure	0.0141 (0.0044)	0.0140 (0.0043)	0.0143 (0.0045)	0.0146 (0.0044)
Inflation rate	-0.0191 (0.0082)	-0.0213 (0.0079)	-0.0182 (0.0082)	-0.0183 (0.0078)
Growth rate of terms of trade	0.071 (0.026)	0.075 (0.026)	0.074 (0.026)	0.078 (0.026)
Contemporaneous IMF loan	-0.257 (0.062)	-0.243 (0.062)	-0.229 (0.072)	-0.222 (0.072)
Lagged IMF loan	--	-0.118 (0.063)	--	-0.100 (0.070)
Contemporaneous IMF participation	--	--	-0.0041 (0.0055)	-0.0025 (0.0057)
Lagged IMF participation	--	--	--	-0.0035 (0.0056)
p-value	0.0001	0.0000	0.0001	0.0002

Table 6, Continued

	(5)	(6)	(7)	(8)
Instruments	**IMF quotas and staff, political proximity to the U.S. and Europe, trade intensity with the U.S. and Europe**			
Log(per capita GDP)	-0.0225 (0.0044)	-0.0251 (0.0043)	-0.0238 (0.0045)	-0.0268 (0.0046)
Male upper-level schooling	0.0035 (0.0019)	0.0031 (0.0019)	0.0039 (0.0020)	0.0036 (0.0019)
Log(life expectancy)	0.038 (0.020)	0.046 (0.019)	0.044 (0.020)	0.054 (0.020)
Log(total fertility rate)	-0.0265 (0.0065)	-0.0278 (0.0063)	-0.0254 (0.0066)	-0.0264 (0.0065)
Investment/GDP	-0.002 (0.032)	-0.007 (0.032)	-0.014 (0.033)	-0.020 (0.033)
Government consumption/GDP	-0.066 (0.026)	-0.062 (0.026)	-0.070 (0.027)	-0.067 (0.027)
Rule-of-law index	0.0091 (0.0082)	0.0105 (0.0080)	0.0084 (0.0082)	0.0099 (0.0081)
Openness measure	0.0143 (0.0045)	0.0139 (0.0043)	0.0147 (0.0045)	0.0143 (0.0044)
Inflation rate	-0.0182 (0.0067)	-0.0196 (0.0067)	-0.0170 (0.0068)	-0.0188 (0.0069)
Growth rate of terms of trade	0.074 (0.026)	0.082 (0.027)	0.081 (0.026)	0.089 (0.027)
Contemporaneous IMF loan	-0.122 (0.092)	-0.084 (0.096)	-0.039 (0.108)	-0.007 (0.112)
Lagged IMF loan	--	-0.272 (0.097)	--	-0.265 (0.116)
Contemporaneous IMF participation	--	--	-0.0125 (0.0081)	-0.0115 (0.0087)
Lagged IMF participation	--	--	--	-0.0021 (0.0091)
p-value	0.188	0.007	0.118	0.015

Notes to Table 6

The system has 5 equations, corresponding to the periods 1975-80, 1980-85, 1985-90, 1990-95, and 1995-2000. The dependent variables are the growth rates of per capita GDP. Data on GDP through 1992 are from Summers and Heston (1991), Penn World Table 5.6. Figures were updated through 2000 from the World Bank*, World Development Indicators*, and the IMF, *World Economic Outlook*. The log of per capita GDP and the average years of male secondary and higher schooling are measured at the beginning of each period. The log of life expectancy at birth is an average for the previous five years. The ratios of government consumption (exclusive of spending on education and defense) and investment (private plus public) to GDP, the inflation rate, the total fertility rate, and the growth rate of the terms of trade (export over import prices) are period averages. The rule-of-law index is the earliest value available (for 1982 or 1985) in the first equation and the period average for the other equations. The openness measure is the ratio of exports plus imports to GDP, filtered for the estimated effects on this measure from the logs of population and area.

Estimation is by three-stage least squares. Instruments are the actual values of the schooling, life-expectancy, openness variable, terms-of-trade variable, dummy variables for prior colonial status (which have substantial explanatory power for inflation), and lagged values of the log of per capita GDP, the government consumption ratio, the investment ratio, and the rule-of-law index. The actual values of contemporaneous and lagged IMF loan size and program participation (when the participation variables are included) are used as instruments in columns 1-4. Columns 5-8 use as instruments the contemporaneous and lagged values of the log of the IMF staff share, the log of the IMF quota share, the log of the fraction of U.N. votes along with the United States and major Europe, and the log of the trade intensity with the United States and major Europe. The IMF loan size and participation variables are not included in these instrument lists. Individual constants (not shown) are included for each period. Standard errors are reported in parentheses. The p-value indicates the significance level associated with the test of the hypothesis that the coefficients on the IMF program variables included in each column are jointly zero.

Figure 1. The Increase in IMF Loan Size by

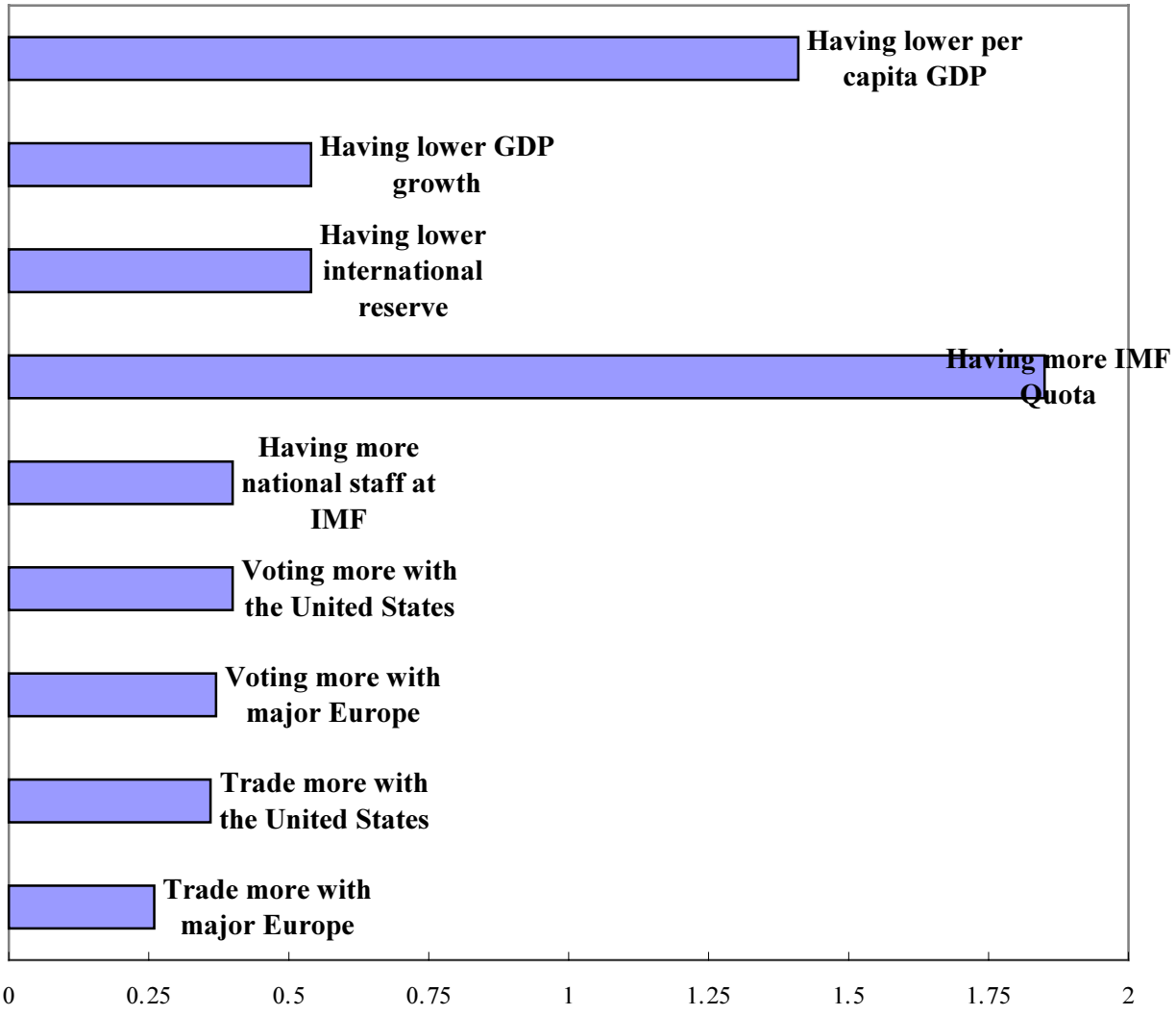

Figure 2. The Increase in IMF Program Participation by

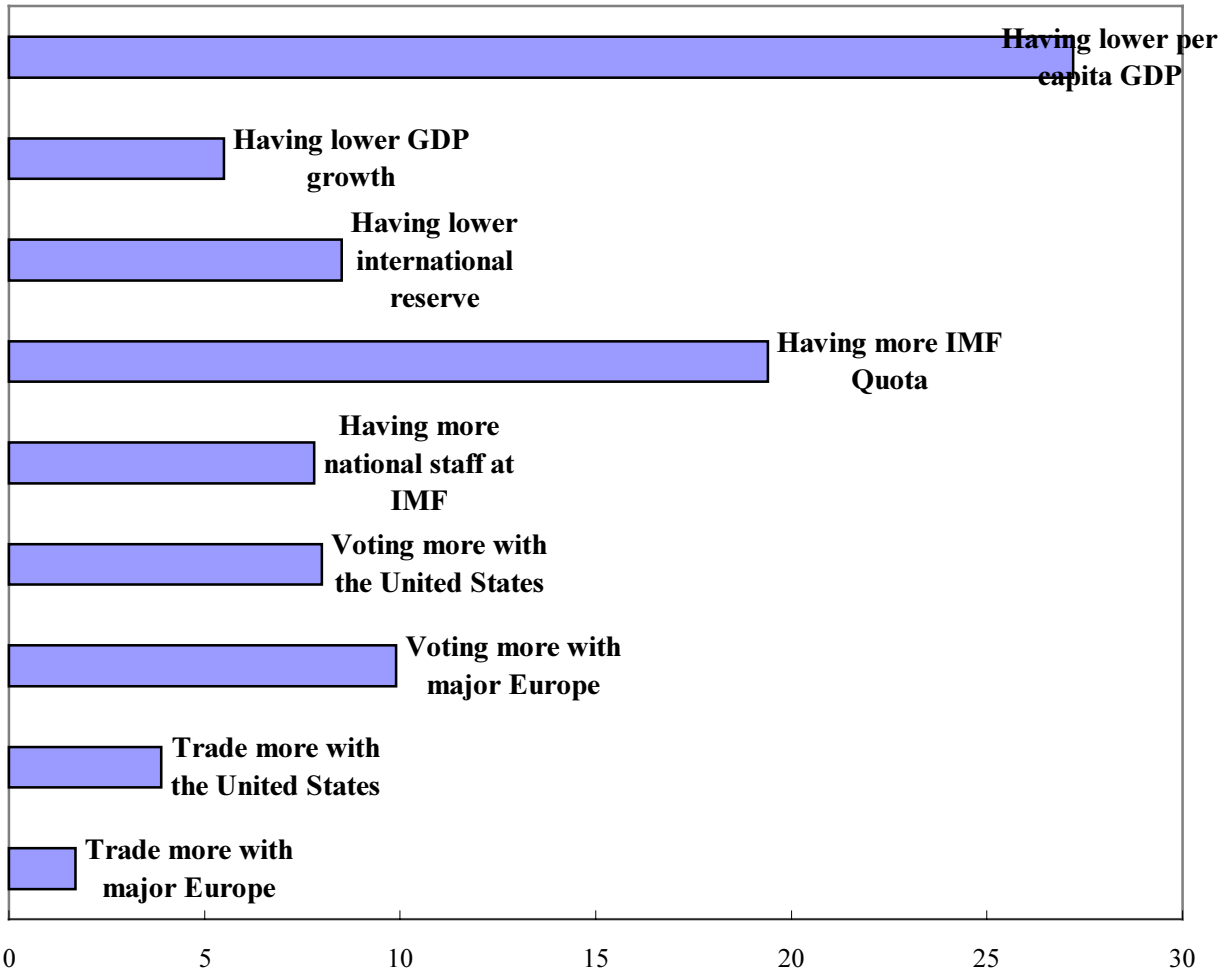

Figure 3. The Increase in the Probability of IMF Loan Approval by